Docket No. 1878.019
(SJW/lhd/48284)

ABRASIVE ENTRAINMENT

Abstract of the Disclosure

A method for generating a high-velocity cutting jet comprises forming a high velocity jet of a liquid such as water, forming a suspension of an abrasive such as garnet in a carrier gas containing a condensable vapour such as superheated steam, and entraining the abrasive suspension into the liquid jet so that the vapour condenses, producing a cutting jet of a liquid/abrasive mixture. A cutting head of apparatus for generating the cutting jet has a chamber into which the abrasive suspension is passed. The liquid jet traverses this chamber, entraining the suspension, and passes into a tapering transition region and a bore of a nozzle. Kinetic energy is transferred from the liquid jet to the abrasive as they pass trough the chamber and the nozzle. Condensation of the vapour ensures that the cutting jet leaves the nozzle at close to ambient pressure, reducing the diameter of the cutting jet compared to conventional abrasive-in-air systems, so as to increase the energy density of the abrasive.